VOL. IV. NO. 199.

GARDEN AND FOREST

A JOURNAL OF HORTICULTURE LANDSCAPE ART AND FORESTRY

DECEMBER 16 1891

PRICE TEN CENTS.] Copyright, 1891, by THE GARDEN AND FOREST PUBLISHING COMPANY. [$4.00 A YEAR, IN ADVANCE.

"AMERICAN WOODS."

A book on Woods, containing *actual and authentic specimens.*

It would make a beautiful Holiday Present.

Send for circular, mentioning journal.

R. B. HOUGH, Lowville, N. Y.

Parsons & Sons Co.

LIMITED.

Kissena Nurseries, Flushing, N. Y., offer

Rhododendrons

of American grown hardy sorts.

Hardy Azaleas.

For other rare and old plants, see Catalogue.

GREENHOUSES, PALM-HOUSES, CONSERVATORIES.

IRON CONSTRUCTION,

PATENT IMPERISHABLE PUTTYLESS GLAZING.

Under this construction, Greenhouses are free from the constant annoyance of broken glass, frequent painting, and rapid decay. Over 40,000 square feet of glass under construction at present time. Send stamp for postage of Catalogues, Circulars, &c., to

JOSEPHUS PLENTY,

HORTICULTURAL AND SKYLIGHT WORKS.

New York Office: 145 Liberty St.

Mail Office & Works: 148-156 Randolph Ave., Jersey City.

FIRE! FIRE! FIRE!

A. H. HEWS & CO.

Wish to inform their customers that, notwithstanding the recent disastrous FIRE in their Factory, through the kindness of their friends in the trade they will be able to fill all orders which they may receive with an excellent quality of

STANDARD FLOWER POTS.

All orders will receive prompt attention.

HARDY PLANTS.

Rhododendrons, Japanese Maples, Hardy Azaleas, Rare Trees and Shrubs. The finest and most complete stock in America. The finest Catalogue in the world is sent for 25 cts., which is allowed on first order.

B.A. ELLIOTT COMPANY, Pittsburgh, Pa.

HARDY PLANTS.

Descriptive Catalogue of 100 pages will be mailed to all applicants. Hollyhocks, Iris, Paeonies, etc., together with many NEW SORTS not before offered.

H. MEYERS,

Lock Drawer E,—Late Woolson & Co.—Passaic, N. J.

Ornamental Trees

SHRUBS AND CONIFERS.

Finest collection in New England. Includes the best novelties. 90-page catalogue full of good hints.

LARGE AND SMALL FRUITS.

Proved for New England climate. 28-page catalogue with culture.

HARDY BORDER PLANTS.

Finest collection in America. 60-page catalogue. Over 800 varieties described. The most complete on the subject in America. The above are "Three Valuable Handbooks." All plants can be seen at the Nursery, which was established in 1854.

JACOB W. MANNING,

THE READING NURSERY, Reading, Mass.

All Catalogues Free.

FOR ORCHIDS that will grow and blossom all the year, apply to SANDER'S, St. Albans, England. Largest and finest stock in the whole world. Thirty minutes from St. Pancras. Our Agent, Mr. A. Dimmock, will be pleased to interview buyers, or reply to any communication addressed to him at 205 Greenwich Street, New York City.

N.Y. Engraving and Printing Co.

PHOTO-PROCESSES.

ENGRAVED PLATES FOR ALL ILLUSTRATIVE PURPOSES

320-322 Pearl Street,

NEW YORK.

SILVER MEDAL

AWARDED FOR

Spiræa Japonica grandiflora

(NEW) and

SPIRÆA ASTILBOIDES.

A first-class collection of

HARDY HERBACEOUS PERENNIALS.

Aquilegias, Asters, Delphiniums, Gaillardias, Œnotheras, Potentillas, etc., etc.

HARDY SHRUBBERY.

Hydrangea paniculata grandiflora, Spiræas Thunbergi and Van Houttei, etc.

Roses, Clematis, Altheas, Berberis Thunbergi, etc., etc.

☞ Catalogue free.

REA BROTHERS, NORWOOD, Mass.

BOTANISTS AND NATURALISTS

SHOULD HAVE MY CATALOGUE.

American Wild Flowers. By GOODALE and SPRAGUE. Fifty-one fine-colored plates. Quarto, cloth, $15.00.

Manual of the Mosses of North America. By LESQUEREUX and JAMES. Six plates of the Genera. Octavo, cloth, $4.00.

Behren's Guide to the Microscope in Botany. Translated for American students. By HERVEY and WARD. Fully illustrated. Octavo, cloth, $5.00.

*** Complete catalogue sent on receipt of one cent stamp. Books to be had of all dealers, or sent post-paid by

BRADLEE WHIDDEN, 18 Arch St., Boston, Mass.

HARDY RHODODENDRONS

AND

AZALEAS.

THE LARGEST AND BEST STOCK IN THE WORLD.

Nearly all the kinds which have proved hardy in the vicinity of Boston originated in this Nursery, and we have a supply of many hundred thousands of sturdy healthy plants, well budded and true to name.

HARDY AZALEAS. Thousands of the handsomest varieties known.

The RHODODENDRONS exhibited at the Centennial at Philadelphia were from ANTHONY WATERER, as are also the Rhododendrons and Azaleas in Rotten Row, Hyde Park, London.

Catalogues, priced and descriptive, from

ANTHONY WATERER,

Knap Hill Nursery, Woking, England.

HARDY ROSES
(For Fall Planting.)
The largest stock in America. | NEWEST VARIETIES FINEST PLANTS.
Complete Catalogue FREE. **ELLWANGER & BARRY** Mt. Hope Nurseries, ROCHESTER N.Y.

BOUND VOLUMES
OF
GARDEN AND FOREST
FOR 1891.

The bound volumes of Garden and Forest for 1891 will be ready for delivery early in January. To accommodate subscribers and others who have purchased the previous volumes, we will accept all orders up to December 31, 1891, as far as the stock will admit, at the regular price, namely, $6.00 a volume. Should any copies then remain unordered the price will be advanced after that date.

The following is the price of the Bound Volumes:

Vol. I. (year 1888), . . $10.00
Vol. II. (year 1889), . . 10.00
Vol. III. (year 1890), . . 10.00
Vol. IV. (year 1891), . . 6.00

GARDEN AND FOREST PUBLISHING CO.,
Tribune Building, New York.

50 OTHERS

have yet to make a record which will justify public confidence. The United States Mutual Accident Association has made its record, and 55,000 bright business men are its members.

Charles B. Peet,
President.

James R. Pitcher,
Sec. & Gen. Mgr.

320, 322 & 324 Broadway,
New York.

Hatch Chickens by Steam.
IMPROVED **EXCELSIOR INCUBATOR**

Will do it. Thousands in successful operation. *Simple, Perfect and Self-Regulating.* Lowest-priced first-class Hatcher made. Guaranteed to hatch a larger percentage of fertile eggs at less cost than any other. Send 6c. for Illus. Catalog. GEO. H. STAHL, Quincy, Ill.

GOLD MEDAL, PARIS, 1878.
W. BAKER & CO.'S
Breakfast Cocoa

from which the excess of oil has been removed,
Is absolutely pure and it is soluble.
No Chemicals
are used in its preparation. It has *more than three times the strength* of Cocoa mixed with Starch, Arrowroot or Sugar, and is therefore far more economical, *costing less than one cent a cup.* It is delicious, nourishing, strengthening, EASILY DIGESTED, and admirably adapted for invalids as well as for persons in health.
Sold by Grocers everywhere.
W. BAKER & CO., Dorchester, Mass.

V. LEMOINE & SON,
NANCY, FRANCE.
Catalogue of Novelties, including BEGONIAS ZONALES, PELARGONIUMS, GLADIOLUS, MONTBRETIAS, etc., etc., now ready, and will be mailed free on application to their Agents:
C. C. ABEL & CO., New York.

THE GREAT AMERICAN TEA COMPANY
CHANCE FOR ALL
To Enjoy a Cup of Perfect Tea, A TRIAL ORDER of 3½ pounds of Fine Tea, either Oolong, Japan, Imperial, Gunpowder, Young Hyson, Mixed, English Breakfast, or Sun Sun Chop, sent by mail on receipt of $2.00. Be particular and state what kind of Tea you want. Greatest inducement ever offered to get orders for our celebrated Teas, Coffees and Baking Powder. For full particulars address THE GREAT AMERICAN TEA CO.
P. O. Box 289. 31 and 33 Vesey St., New York.

"THE NEW METHOD"
for good health cures all chronic diseases.
Rev. A. Albro, D.D., Utica, N. Y., writes: "One of the greatest boons to mankind in modern days." Infinitely better than the Hall System. Half the price. Send for testimonials.
HEALTH SUPPLIES CO., 719 BROADWAY, N. Y.

PAINT YOUR ROOFS
WITH
DIXON'S SILICA GRAPHITE PAINT
Water will run from it pure and clean. It covers double the surface of any other paint, and will *last four or five times longer.* Equally useful for any iron work. Send for circulars. JOS. DIXON CRUCIBLE CO., Jersey City, N. J.

$3.00 1892 $3.00
The Overland Monthly

Subscription Price Reduced to
THREE DOLLARS A YEAR.
The Overland
Is the Representative Magazine of the Pacific Coast!
EVERY NUMBER WILL BE ILLUSTRATED.
IMPROVEMENTS IN EVERY DIRECTION!
The Home Seeker, the Investor, the Student of American Life and History, must have it.
In making up your lists for 1892, include The Overland.
Send 10 cents for Sample Copy.
Address
Overland Monthly,
420 MONTGOMERY STREET, SAN FRANCISCO, CAL.

Garden and Forest.

Among the contents of next week's issue (No. 200) will be the following articles:

Hemlocks in Winter. (With illustration.)
Editorial.

Deering's Woods, Portland, Maine.
By Mrs. J. H. Robbins.

Good Begonias.
By W. E. Endicott.

Notes on Hardy Plants.
By J. W. Manning.

The paper will contain an illustration of a winter scene in a forest of Hemlocks.

GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, DECEMBER 16, 1891.

TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—Yellowstone National Park 589
Books about Nature published in America 590
Notes of a Summer Journey in Europe.—I . . . . . *J. G. Jack.* 590
The Colors of Leaves . . . . . *E. Williams Hervey.* 591
Cacti in Landscape-gardening . . . . . *John De Wolf.* 592
NEW OR LITTLE-KNOWN PLANTS:—Viburnum tomentosum. (With figures.). *C. S. S.* 593
CULTURAL DEPARTMENT:—Deterioration of Varieties . . . . . *T. H. Hoskins, M.D.* 593
Cyclamen Persicum. . . . . *N. J. Rose.* 593
Winter Gardening in the South . . . . . *Professor W. F. Massey.* 596
Cattleya labiata, Scabiosa Caucasica . . . . . *E. O. O.* 596
Rust of Carnations . . . . . *Professor Byron D. Halsted.* 596
Spiræa Filipendula flore pleno, Thermopsis Caroliniana . . . . . *M. Barker.* 596
THE FOREST:—The Subjection of Torrents by Reforestation of Mountains.—II. *M. P. Demontzey.* 597
CORRESPONDENCE:—The Great Wurtemberg Linden . . . . . *H. Christ.* 598
Damping Off . . . . . *Wm. S. Lyon.* 599
Are Large Strawberries a Modern Production? . . . . . *E. Lewis Sturtevant.* 599
PERIODICAL LITERATURE 599
NOTES 599
ILLUSTRATIONS:—Viburnum tomentosum, Fig. 93 594
Viburnum tomentosum in Bloom, Fig. 94 595

Yellowstone National Park.

IN the early days of the last session of Congress we invited public attention to the necessity of prompt legislative action in regard to the enlargement and better protection and maintenance of the Yellowstone National Park. We expressed at that time a fear that nothing would be accomplished, owing to a persistent and untiring lobby that would prevent the enactment of any law which did not carry with it an exclusive right or franchise for a railway through the north-east corner of the park. The event proved that this apprehension was well-founded. No action was taken by the House of Representatives on the excellent bill which passed the Senate, and which was practically the same bill which had passed that body on four separate occasions. The House, upon receiving the bill from the Senate, referred it to the Committee on Public Lands, and it was by them, after a long delay, reported back to the House with an amendment granting a right of way to the Montana Mineral Railway Company to enter the park and to lay fifty or sixty miles of track to a mining camp lying in Montana outside of the reservation. This amendment was in no way germane to the bill, but a positive injury to the park and the beginning of special privileges and jobberies which would in the end hand the park over to corporations who had no generous or patriotic interest in it or appreciation of it, and cared only to use it for their own selfish purposes. Those who took the deepest interest in the park preferred the postponement of the passage of such a bill until it could be placed on the statute-books without such an objectionable feature as the Montana Mineral Railway franchise.

In the last days of the last session, Congress passed a law entitled, "An Act to Repeal Timber-culture, and for Other Purposes," and among its provisions was one to which we have often alluded. It reads as follows: "The "President of the United States may, from time to time, set "apart and reserve in any state or territory having public "land bearing forests, in any part of the public lands, or "wholly or in part covered with timber or undergrowth, "whether of commercial value or not, as public reserva- "tions. And the President shall by public proclamation "declare the establishment of such reservation and the "limits thereof." In accordance with this provision the President issued a proclamation setting apart as a public reservation a large tract of country immediately adjoining the Yellowstone Park on the east and south. The boundaries of this forest-reservation are essentially the same as those laid down in Senator Vest's bill providing for the enlargement of the park. As a matter of fact, we believe the boundaries were taken from the bill. This action on the part of the President was most commendable as it prevents the cutting of timber and prohibits settlement within the reservation. But as the President had no power to enlarge the Yellowstone Park it is now all the more important that this reservation should be included in the park by Act of Congress and its care and protection made a part of the duties of the superintendent of the park, with authority to see that the rules and regulations established by the Secretary of the Interior are enforced. At the present time there are no penalties for depredations committed, and no power to enforce them if there were any.

Secretary Noble, in his last annual report recently published, calls attention to the needs of the park and takes strong grounds against the admission of any railway. We can do no better than to copy his words: "The Secretary's "opinion, as hitherto expressed, has been that a railroad "would be detrimental to all the purposes for which the "park was set apart. It is earnestly hoped that Congress "will not give up to a private enterprise any part of what "it has set apart for the education and enjoyment of the "whole people. If once such railroad franchise is granted "it will result in the practical abandonment of that region "as a forest and game-reserve. Each year demonstrates "the wisdom of Congress in setting apart this magnificent "domain and the necessity of keeping it under govern- "ment ownership, free from private or corporate intrusion. "It embraces one of the largest forest-bearing districts in "the Rocky Mountains, and contains the head-waters of "some of our greatest rivers. The importance of preserv- "ing such tracts, as affecting the water-supply of the coun- "try, has already been discussed in this report."

Senator Vest, who takes the deepest interest in all matters pertaining to the Yellowstone Park, has for many years earnestly endeavored to obtain favorable action by Congress, and intends introducing the bill of last year in the early days of this session. The tract of country which it is desired to add to the park on the east embraces all the high portion of the Absaroka Range, and is a belt of country between twenty-four and twenty-five miles in width, including all the sources of the upper Yellowstone River. The region is almost wholly made up of volcanic lavas, barren and rugged, but possessing great natural beauty and grandeur. The country which it is proposed to add to the park on the south measures about eight and one-half miles in length, stretching across the entire width of the park and the additional territory which it is proposed to annex to the eastward. It is a somewhat less rugged country than the Absaroka Range, but is equally grand and far more picturesque. It abounds in springs, brooks and lakes, all of them sending their waters westward to the Pacific. The country is one of the best breeding-grounds for elk and deer to be found anywhere in the Rocky Mountains, a knowledge of which is becoming only too rapidly known by hunters and sportsmen. For agricultural and grazing purposes this elevated region is useless. The forest, both in the park and the country which it is proposed to add to it, is essentially coniferous. More than one-half the trees are what are known as Black Pine (*Pinus Murrayana*), which rarely attains any great size, although for economic purposes, for the storing of water, it is quite as serviceable as the more stately trees. The Balsam (*Abies subalpina*), the Spruce (*Picea Engelmanni*), cover large

tracts of country, while all three of these species occur more or less mingled. That sturdy and stately tree, the Red Fir (*Pseudotsuga taxifolia*), in certain localities, stands out grandly conspicuous for its size and the vigor of its growth. Already fires kindled by accident or malice have swept over large areas of this timber, and the forest has no protection against such vandalism in the future.

Secretary Noble, in his recommendation quoted above, only repeats what has been urged before by Secretaries Vilas and Lamar. The need of extending the park and protecting it from invasion is universally recognized. The Senate Bill interferes with no one's rights, and the new boundaries leave an open highway for all needed traffic to the mines. How long shall we be compelled to admit, in the face of all this, that a little knot of speculators, in the hope of securing special privileges, are strong enough to defeat a measure which is to the evident advantage of the whole country?

The appearance of the little book entitled "The Land of the Lingering Snow," which we reviewed last week, suggests anew a reflection which has, no doubt, occurred to many of our readers, and that is one of surprise at the number of books about Nature which are annually published in America, many of them, too, characterized by delicate feeling and pleasing style. More books of this type are published here than in England, where sentiment and the love of natural objects are believed to flourish much more luxuriantly than in our hurrying, supposedly prosaic and distinctly urban communities. Most of these books, too, are written in New England and about New England scenes and plants and birds; and this fact has a curious interest. At first sight we may think that it simply means that only in comparatively old communities do men find leisure enough to devote themselves to the harvest of the quiet eye, or are they apt to inherit a culture broad and deep enough to endow them with that literary sense which must go hand-in-hand with a sensitive mind and keen vision if nature is to be worthily interpreted on the printed page. But a little reflection shows that New England is no older than the other communities along our eastern coasts, and also that the sons and daughters of the east have spread themselves abroad to west and south, where, one might fancy, their natural instincts would be more strongly stimulated by the scenes about them than they could be by a climate and a soil like those of New England. Nevertheless, it is New Englanders living at home who give us most of those books about nature which are not strictly scientific accounts of dry facts and recondite phenomena. Here are born and here write our prose poets of nature. Is this so because Thoreau chanced by an accident to be born here, and set a local fashion? Or was Thoreau a natural, typical product, and are his successors likewise natural, typical products of the same conditions—men and women who would have felt and written just as they do if Thoreau had never lived?

The latter view is, we think, the true one. And, perhaps, it can be interpreted to mean that men always value most highly the gifts which are not too lavishly bestowed, delights which are not too constant and monotonous, pleasures for which they have to work a little and of which they are sometimes unexpectedly deprived. It is the strong contrasts of the New England climate which have filled the souls of her sons with so keen a sense of the beauty of her bright winter days and the loveliness of her sunny summer hours. It is the contrasts which her soil affords—from rocky to verdurous sea-coasts, from high mountains and forest-clad valleys to fertile plains and Elm-bordered rivers—which make their eyes sensitive to each of her changing pictures. It is the length and vigor of her winters that have forced them to study what charms winter as well as summer may present. It is the late shyness of her springs that thrills them with a sense of spring's enchantment. It is the burning heat of her hottest summertime which puts a touch of enthusiasm into blood that would be chilly but for such a potent quickening. It is the royal splendor of her long-drawn autumn, with its soft Indian summer following almost wintry weeks, that gives them that love for color which we miss by contrast when we turn to books that Englishmen have written.

An inhospitable land New England may be called by the agriculturist or the man who likes simply to draw his breath without care or trouble or any noting of outward phenomena. But to the true lover of nature there is, perhaps, no other which offers a more generous hospitality and has its hands more profusely laden with rapidly changing, beautifully contrasting gifts.

Notes of a Summer Journey in Europe.—I.

The following notes of observations, made during a few weeks of the past summer spent mainly in seeing something of collections and botanical establishments in Europe, are not intended as studies, but chiefly as a record of impressions with the natural comparisons one is apt to draw among new scenes and on coming in contact with examples and practices not commonly met with at home. Very often, too, the meeting of familiar objects proves almost as interesting as the novelties. The short time at command necessitated leaving out many interesting places and specimens even on the line of the journey, and, for the same reason, it was not found possible or advisable to fully write out the notes at the moment.

Perhaps one of the first things which attract the attention of an American, if he is interested in the botanical side of Nature, on landing on the Continent and traveling through the country is, that vegetation, as shown in harvesting, etc., is generally not so advanced or hurried as it is at the same date in that portion of New England which nearly corresponds to the same latitude. The cooler summers and the generally greater humidity of the air, of course, account for this, besides giving those regions nearest the sea the perpetually green appearance for which they are noted. It may be for this reason that hybrid Perpetual Roses appear to be much more truly and satisfactorily perpetual bloomers than they often prove in our gardens, where the heat is much drier and more intense.

On arrival at Boulogne, the first landing-place, on July 15th, the Hybrid Perpetual Roses were found bearing an abundance of bloom, and the same was true at Paris. The blossoms of these Roses, however, were no better than we commonly grow at home, and, as is too often the case with us, the plants were badly attacked by mildew and infested by aphides. The latter were evidently greatly checked by lady-bird beetles and their larvæ, and by small parasites similar to those which we find in America assisting to keep the pests in check.

One of the most peculiar features in the landscape in crossing certain parts of France, noticeably in the lowlands and as we approach the Swiss frontiers, is the Lombardy Poplars, which loom up everywhere, like decorated telegraph-poles. Very frequently the greater portions of the trunks have been stripped of their branches, which gives them an even more singular appearance than they naturally possess. It may not be generally known that it is the staminate, or male form, of this tree which we commonly find in cultivation both in this country and in Europe. The female, or pistillate form, is very rarely seen. It is said to chiefly differ from the male in being much less pyramidal in its habit of growth and general outline.

As we approach Switzerland and get among the hills, the Walnut becomes abundant, and it may be seen planted singly, in groves or in orchards, alternately with Apple, Pear or Plum-trees. The size and shape of these Walnut-trees vary greatly according to the quality of the ground and the exposures to which they are subjected; but in the good rich soil of the sheltered valleys they assume a handsome rounded or globular form. They do not usually attain a great height, and, except for the color of the foliage, which is also less dense, they might at some distance be mistaken for very large Apple-trees. Wherever grown throughout Switzerland, the nuts are largely used for the oil which is extracted from them; but they are not generally grown in such abundance as they are south of the Alps.

Although Geneva gets none of the direct modifying influence of the Gulf Stream, is over 1,200 feet above sea-level, and is situated in a latitude somewhat further north than that of Montreal, in Canada, its vegetation shows that it enjoys a winter climate generally quite as mild, if not milder, than that of Washington. The last winter was considered an unusually severe one, the Lake of Geneva being completely frozen over,

an event of extremely rare occurrence. Our great southern evergreen Magnolia is frequently planted in gardens here, and a large number of them were noticed as either dead or very much injured. In fact, the straggling appearance of the best of the survivors showed that the trees are here liable to more or less injury every winter. Some were bearing a good number of their beautiful blossoms, for the sake of which no lover of flowers could resist having these trees in his garden so long as there was a chance of their living at all. The trees do not attain large size here, but grafted plants may be expected to bloom when only a few feet high.

At this time (July 17th to 20th) some large trees of *Catalpa bignonioides* were in full flower, or nearly so, and were apparently quite as much at home and as vigorous as in our own gardens. Specimens of a fastigiate form of our common Locust were noted here and there, the shape being so much like that of the Lombardy Poplar that unless closely observed this form of the Locust might be mistaken for it. The variation of the Locust known as *Robinia Pseudacacia, monophylla*, is occasionally seen in the streets and yards here, presenting such a distinct aspect that many people, not familiar with the numerous forms which the species has developed under cultivation, might readily mistake it for something new. This form often has only one, and usually not more than three large leaflets to each leaf. It must be propagated by grafting, layering, from pieces of roots, or other modes of division, in order to be true, as seeds would probably simply produce the common type, except in a very few cases. Although it is one of our own native trees, the Locust in Europe has a much better chance to develop into good specimen trees when planted singly, because it is, apparently, not liable to injury from such destructive borers as we have to guard against.

Some fine specimens of our Black Walnut (*Juglans nigra*) are to be seen in Geneva, and a tree of the Striped Maple (*Acer Pennsylvanicum*) was noted as having a spread of branches of about thirty feet, and with an equal height. It was grafted on the Sycamore Maple (*A. Pseudoplatanus*), and the stem was ten inches in diameter, being smaller than its dark shaggy-barked stock.

A peculiar feature of some of the streets and quays where shade and, at the same time, an unobstructed view of mountains or lake from houses or hotels is desired, is the rows of trees cut back so that they have a low, flat, or umbrella-shaped top, while the lower branches are trimmed high enough to allow of all ordinary passing beneath. The species most subjected to this treatment, and one which apparently bears it very well, is the variety of the Oriental Plane-tree known in nurseries as *Platanus acerifolia*. This form is very much planted in many Continental cities, and, altogether, as a street tree it compared very favorably with any other kind which came under my notice. The trees rarely showed any evidence of disease. Such a serious blight as the fungus (*Gliosporium nervisequum*), which destroys the growing tips of, and is so injurious to, the Planes in many parts of America, is, seemingly, unknown among the allied trees in Europe; or, at least, it does not appear to a noticeable extent. The foliage, too, is usually remarkably exempt from depredations by insects. The trunk is not liable to attack by borers, and although the peculiar blotched appearance of the trunk is objected to by some people, it has the merit of being smooth and looking as if scraped —facts which are greatly to its advantage in localities where a mania prevails for having the trunks of rough-barked trees smoothly planed or shaved.

The trunks of the trees in the streets of Geneva rarely show any evidence of mechanical injury. Stems of the smaller trees are very simply and effectively protected by having shoots or branches of Locust or Buckthorn placed around them and held in position by two or three bands of light iron wire.

Three species of European Lindens, or Lime-trees, were particularly noticed in the streets and squares. One of these, known as *Tilia platyphylla*, had been out of blossom for some time and the fruit had already attained almost full size. The second species, perhaps, should be known as *T. ulmifolia*, although it is most commonly called *T. parvifolia*, and, among other synonyms, frequently passes as *T. Europæa*. This was in full bloom and attracted many insects. The apparent reason of the name *ulmifolia*, or "Elm-leaved," was quite noticeable in some very large trees here, because the foliage and even the outline of the tree gave much the same effect as that of the common European Elm (*Ulmus campestris*), the leaves of the Linden not being much larger. The foliage of this and the preceding species was sometimes greatly injured by the attacks of aphides and red mites. The third Linden noticed was *T. petiolaris*, a species differing from the others in its distinct habit, its long, petioled leaves with white under-surfaces, and especially in the fact that it had not yet opened any of its flower-buds.

Other Lindens may be referred to later, but attention is called to those mentioned because here were three species flowering in such succession as to furnish a rich and continuous harvest of nectar for bees during a period of six weeks or more—a fact, perhaps, well worth considering when planting trees in a country where apiculture is much followed and where the honey made from the flowers of the Linden is especially prized.

Arnold Arboretum. *J. G. Jack.*

The Colors of Leaves.

IN my article on the colors of flowers the conclusion arrived at is that, next to green, white is the primary color, and the color from which all other colors are derived.

Another question has suggested itself to my mind since writing the former paper—a question entirely germane to the subject—namely, Is the green color of leaves and vegetation generally the original, primordial color, or is it secondary?

The method to be employed in answering this is somewhat different from that used in regard to flowers. We do not find any leaves with a different color at the base, as is common in the case of flowers as, for instance, white; indeed, rarely is a leaf any other color than green when it is found on a stem growing spontaneously in its native habitat, except in the case of vigorous saplings, where the old trees have been felled. On these not uncommonly the leaves are reddish or purple. In cultivated plants, also, we have copper-leaved Beeches, Maples, etc., and some herbaceous plants with reddish foliage. The colors of autumn leaves are not referred to for the reason that they are clearly secondary. One other color occurs more rarely still, and that is white. Dr. E. Lewis Sturtevant pointed out to me at Nonquitt, Massachusetts, growing spontaneously on a border of a marsh, a grass called *Phalaris arundinacea*, var. *picta*, which had longitudinal stripes of white running parallel with the green, and similar in appearance to the garden Striped Grass. In my former article I referred to the fact that sepals and involucres sometimes become white, as, also, some of the smaller upper leaves and upper portion of the stem in *Daucus Carota;* but while native plants with white leaves are rare, there are frequent examples of white in cultivated foliage plants, so called. Among the latter is a variety of the Ash-leaved Maple, which has every leaf bordered with white, presenting to the beholder an odd and fantastic appearance, also a shrubby Althea, similarly marked; also Euphorbia, Ivy Geranium, Coleus, Funkia, Century-plant, etc., are bordered, striped, or splashed with white. The inner leaves of Cabbage are white, and Celery blanches white. This etiolated condition of the foliage is regarded by gardeners to be the result of disease or unhealthiness, and, therefore, not desirable, but yet is tolerated on account of the striking, if not wholly pleasing, effect produced by the unusual contrast of colors. From the foregoing we get pretty strong hints that green is derived from white. There remains one more clue. Every botanist knows that the seed contains a miniature and rudimentary plant; that generally the most prominent parts of this seed are the cotyledons, or seed-leaves, and these are, of course, the first leaves of every species of plants. Now, if we ascertain the color of these seed-leaves we find the original color of all leaves. This color is uniformly white.

Take, as a few familiar illustrations, the seeds of apple, pear, peach, grape, tomato, cranberry, bean, corn, hickory, chestnut, oak, filbert or almond. Of course we do not refer to the colored integuments of the seed, which, as in the case of garden beans, may be white, red, yellow, blue, black, or mixed colors, but to the kernel, or meat. There are a very few instances only where the green color of the plant has impressed, somewhat, that characteristic upon the seed, as in peas, nasturtiums and maples, which present a pale green color in the pod, or shell. In some instances, these cotyledons appear above the surface of the ground changing from white to green; while in others they remain below, where planted, only to nourish the growing stem and succeeding leaves.

Nature, which has all colors at her disposal, has selected green as being the best adapted for the vegetal function; that is, green is "the survival of the fittest" for that purpose. For the promotion of the fructifying function insect agency is important, both in fertilization and cross-fertilization. Insects are guided, doubtless, by bright colors, as well as by scent, and that the colors may be attractive they must be different in hue from the general foliage and in strong contrast thereto;

hence green barely "survives" in flowers, being more rare than any other color.

We learn from this study of color, therefore, that white is the primary color of root, stem, leaf and flower, and the foundation of all color. This assertion, as regards the flower, may demand a word of explanation, for the reason that in my article above referred to there was an apparent exception in favor of green; but there is really no necessity for any exception or qualification whatever, as white is not primarily derived from green, but, on the contrary, green is derived from white in precisely the same manner as any other color is so derived; but as the floral organs in the great majority of cases are formed after the development of chlorophyl in the plant, they naturally, at first, partake of that color; then the green color is completely eliminated and obliterated, the flower resuming the original color of the rudimentary plant.

It follows, therefore, that green is a secondary color in flowers of that color, of which there are a considerable number still to be met with; but in *Monotropa uniflora*, and doubtless others of like character, we have an illustration of flowers of the original white color which never have been preceded by green.

I may be permitted to add in this connection, as confirmatory of my opinion, that all colors appeared in primeval times, that in Lichens, plants which rank low in the vegetable kingdom, colors are found in as great a range, and possibly greater, than is found in Phænogamous plants, as will be seen from the following partial list of the colors mentioned by Tuckerman in his description of North American Lichens, namely:

White, ashy white, grayish white, dirty white, greenish white, glaucous white, brownish white, ochroleucous, whitish, palescent, decolorate.

Cream, straw, sulphur, lemon, orange, old gold, ochre, gamboge, greenish yellow, orange-saffron, waxy yellowish, tawny yellow, whitish buff.

Sage-green, apple-green, leek-green, brown-green, dark green, black-green, olivaceous, brown-olivaceous, glaucous, glaucescent.

Orange-red, scarlet, vermilion-red, brick color, reddish flesh-colored, blood-red, vinous red, rosy, rose-red, rusty red, rufous, cinereous-rufescent.

Cœrulescent, steel-blue, purple, bluish, pale bluish; sky-blue in *Leptogium cæsiellum*.

Olive, cinnamon, greenish, yellowish, chestnut, russet, tawny, purplish, reddish, smoky, livid, lurid, leaden, liver and blackish brown, tawny.

Black, blackish and olive, greenish, blue and violaceous black, fuscous, fuscescent, brownish and pitch-black.

Lead, greenish lead, smoke-colored.

Whitish, livid, lurid, leaden, greenish and brownish ash, cinerascent, glaucous-cinerascent, cinereus-glaucescent.

Leaden, bluish, yellowish, glaucous and greenish gray, grayish.

The variety of tints, shades and hues of these colors is something remarkable.

In the foliage of Musci we meet the following colors and hues: Hoary white, silvery white, yellowish and greenish white; golden-yellow, greenish yellow, fulvous; reddish, dark vinous red; bright olive, yellowish, lurid, dull and blackish green; green with a bluish or indigo tinge; pale brown, dark brown, purplish brown, brownish, blackish; drab-colored.

In the capsule we find whitish, yellow, orange, orange-red, dark red, deep purple, dark brown and chestnut.

At times the foliage and the fruiting parts are differently colored, as in *Barbula cæspitosa*, which has pale green foliage, yellow capsule with a red operculum.

The sporules are also of different colors; so in Lichens the apothecia or Lichen-fruit, namely, in the part called the disk, differ more or less in color from the thallus. In these respects both classes of plants resemble the frequently different colors of pollen, anthers, petals and leaves in the same plant, so that it may be questioned if the bright colors of ordinary flowers were created primarily to attract insects, unless the apothecium of the Lichen and the capsule of the moss subserve the same purpose, which question should be investigated.

In *Hepaticæ* the colors are similar to the Musci, with the addition of pink, rose-purple and violet.

The *Algæ*, or sea-weeds, lower forms of vegetable life, rival the Lichens in their great variety of color; and the Fungi, plants next higher than the Lichens, display many tints and shades of white, yellow, red, blue and green.

The lowest and the most minute of all known organized structures are *Bacteria*. "These are usually white in color, although some species possess beautiful tints of red, of blue, of yellow, or even green."

New Bedford, Mass. *E. Williams Hervey.*

Cacti in Landscape-gardening.

CACTUS-GARDENS and Water-lily ponds are the most notable additions to the practice of ornamental planting in America during recent years. The Water-lilies have many advocates, but Cactus management does not seem as well understood. In our immense country there is a width of variation in soil and conditions which we hardly realize. Industrial conditions compel many of our people to live in barren or arid regions, and in these Cactaceous plants are of the greatest value. In some of the dry parts of the far west plant-loving people have formed Cactus-gardens of the greatest interest, and of a beauty that vies with the herbaceous gardens of the east. Some of them are stocked with the Cactaceous riches of the earth, and are world-wide in their fame. Even in the showery east there are situations where some varieties of Cactus can be employed. They should not be permitted to occupy positions which can be more acceptably filled by other plants which are by nature more thoroughly adapted to such surroundings, but in a few situations where they are perfectly in keeping, and other things will not thrive, they are most useful. They will flourish in a stone-paved court with only soil enough to root in, and where one day's roasting in summer sunshine would dry other plants to death. They will take their chances on a roof with perfect success, while their owners can spend the summer away from home. For those who still incline to carpet-bedding, the employment of large Cactus-plants, with numerous small ones in geometrical patterns, will afford great pleasure. They do not soon outgrow their space, and they give a most interesting variety of color. The delicate and complicated designs produced with them associate harmoniously with the cut stone and terra cotta of modern buildings.

Their proper arrangement in beds by no means confines us to regular forms, however. The picturesque growth of many sorts especially fits them for irregular arrangement. This can be made with rocks and stones common to the soil in any particular region. The plants need thorough drainage and full exposure to bright sunshine, if they are to bloom the following season. Enough of one variety, especially of the low-growing kinds, should be grouped together, to show their true character and expression. The ground can be as irregular as fancy dictates or chance ordains, for this displays their distinctive qualities to best advantage. Rock-work is a combination that suits them admirably, but it requires great skill in management to insure artistic success. Peculiar and striking stones should, as a rule, be avoided. Those with weather-worn and lichen-covered surfaces are desirable. An exception to this I have noted in a bed where the surface of the ground not occupied by Cacti was entirely covered with pieces of white marble, which brought the plants out in strong contrast. In this case there was so much marble and many white objects in the vicinity that the color was not obtrusive as it otherwise must have been.

When tender kinds are used for planting out in summer, the plants are better kept in their pots, which, however, should be entirely covered by earth or low-growing plants and stones. Sods can be used to advantage when there is grass in the surroundings, but it should be kept shorn short among the plants. Houseleeks, Sedums, Mesembryanthemums, Stapelias, or any low-growing succulent plants that do not need a moist soil are useful for covering the ground and pots. In the warmer parts of the United States permanent Cactus gardens of great beauty can be constructed of many varieties, but the number of these that will endure a temperature of ten degrees below zero is so limited that our efforts north must be less ambitious.

The common Prickly Pear (*Opuntia vulgaris*) and the nearly allied *O. Rafinesquei* and *O. Missouriensis* are the most useful. Some of the little Mamillarias are hardy, but so small and delicately beautiful that a quantity must be employed to be effective. The hardy Opuntias can be grown in flower-beds, if dry enough, with the same cultivation given other flowers, but are more satisfactory if employed where other things will not flourish. As a successful example of their use I recall a spot on one side of a lawn where a rocky ledge came close to the surface. The ledge was once visible but the top had been blasted away and covered with soil. Every summer, however, the grass here dried up and disfigured the lawn. Soaking the place with water twice a day finally kept it green; but this was expensive, and, after all, the turf differed in color and texture from the rest. Some good-sized stones, brought from a neighboring pasture and relaid in the ground on the troublesome spot, following somewhat the irregular outline of the brown grass, and some suitable soil filled in between them, and then more weather-worn rocks

partly embedded in it, gave the whole once more the appearance of a natural ledge. The spaces between the stones were thickly planted with hardy Cacti, that have flourished for four years with no care, and have annually shown a crop of blossoms that vie in beauty with any on the grounds. The place is always interesting and never looks bare.

Again, at one of the finest country places on the north shore of Long Island Sound there is a most attractive summer-house built on a rocky bluff overlooking the water. Before it became part of the pleasure-grounds the top of the bluff had been blown off with dynamite, leaving the surface in a raw and shivered condition, which was depressing to the artistic sense. Covered with soil it yielded a little grass in spring, but this soon died, as did every plant and shrub set there. Vines could not reach it, and contrasted with surrounding beauty it seemed more mournful than ever. This almost hopeless spot was at last planted with native Opuntia, which found the situation congenial, and they now cover the entire surface, hanging over the edge of the bluff in the most effective manner. Starred with brilliant yellow and orange flowers, the effect is particularly fine when seen against the blue water. A hard gravel path leads to the summer-house, and the whole is so uncommonly attractive that visitors always admire it.

At another place hardy Cacti and Stone-crop in variety are used to fill some vases of stone and terra cotta on a terrace overlooking an extensive prospect. The situation is such that other plants could not receive proper attention, but these enduring things hold their own, summer and winter, and the weather-beaten old plants have an attraction all their own.

Cacti are not good playthings for small children, but plants that are often left lying about a greenhouse or garden in summer, objects of no beauty in themselves and a nuisance to everybody who comes in contact with them, could often be grouped about a rock or some barren spot, and thus be made one of the admired features of a place. Like Orchids, Cacti must be studied to be appreciated. If we attempt to grow and arrange them like Roses we shall fail. They are not strictly greenhouse-plants, and forcing often fails. They are the delight of people with moderate appliances and little time to spare for the garden. A light, warm, dry cellar or room, where an even temperature can be maintained through the winter, and all the exposure we can give them in summer, will enable us to keep almost all tropical kinds, while those native to the northern states want but one planting and a chance to grow. They can be moved at any season when the ground can be broken. The monstrosities produced by grafting and mutilation are fit only for people fond of freaks, and not to be considered in serious landscape-work.

New York. *John De Wolf.*

New or Little-known Plants.

Viburnum tomentosum.

THE Japanese Snow Ball, *Viburnum plicatum*, as it is called in gardens, is now one of the best known and most highly prized of the Japanese shrubs commonly cultivated in this country. It is one of the garden forms of *Viburnum tomentosum*, a species widely distributed through China and Japan, whose portrait is published on page 594 of this issue. *Viburnum tomentosum* is a handsome plant, with foliage very similar to that of *Viburnum plicatum*, but the flowers, instead of being all sterile, are mostly perfect, with a few large pure white sterile flowers on the margin of the broad flat cymes which resemble in general appearance those of the familiar *Viburnum Opulus*.

Viburnum tomentosum, although botanists have known it for more than a century, appears not to have been much cultivated outside of its native country, and I do not remember to have seen it in any European collection, although the name appears in the catalogue of the plants in the Arboretum Segrezianum. It seems, however, that it has been in this country for a number of years, and I received last spring specimens from Mr. E. Williams Hervey, of New Bedford, Massachusetts, from a plant which had been growing for many years in Mrs. Edward Haskell's garden in that city, and also from Mr. John Robinson, of Salem, whose plant, originally purchased from Ellwanger & Barry, the Rochester nurserymen, is now twelve feet high and eight feet through the branches. An illustration of this plant in bloom appears on page 595, and shows how completely the flower-clusters cover the branches and render it an object of singular beauty. *Viburnum tomentosum* may be seen, too, in at least two other Salem gardens, and, no doubt, now that attention has been called to it, it will be found to be not uncommon. It is probable that the Japanese use the single form as a stock on which to graft the sterile *Viburnum plicatum*, and that the plants in this country are stocks which have grown at the expense of imported plants of *Viburnum plicatum*. But in whatever manner it may have first reached the United States the normal form of *Viburnum tomentosum* is a handsomer plant in every way than its garden variety, just as *Viburnum Opulus* is a more beautiful and desirable plant than the Snow Ball, a variety derived from it.

Our figure is from a drawing made by Mr. Faxon of a specimen for which we are indebted to Mr. Hervey.

C. S. S.

Cultural Department.

Deterioration of Varieties.

IS there any such thing as a real deterioration of the varieties of our cultivated fruits? By this I mean to ask whether, when a new and valuable seedling of any of our cultivated fruits (or even of our wild ones) is produced, we must expect to see it, with the passage of time, lose its desirable qualities, and fall out of cultivation, necessarily, for that reason? I know that with many growers this view of the subject finds more or less acceptance, and I have held the matter in mind for a long time, subject to the tests of observation and inquiry.

It is not altogether a bad thing perhaps to live in a hard place to grow something that one ardently desires to grow. On this one point I was rather trapped in coming into north-eastern Vermont from eastern Massachusetts. A kind friend cautioned me to look out in regard to schools, and I settled in an academy town; but nobody hinted to me that there were places in New England where the common tree-fruits of the country could not be made to endure the winter's cold. For a while, buying the hardy varieties of the nurserymen's lists, I paid careful heed to the advice of our best books in regard to more or less tender kinds. These were, chiefly, not to grow them on too rapidly, and to cut back severely. Well, I followed the advice, and a few of the many sorts I was trying lived along "at a poor dying rate," bore a little poor fruit, and succumbed to the first test winter. I supposed this to be all in the order of nature and circumstance, until my kind friends, Mr. Goodale, of Maine, and Mr. Manning, of Massachusetts, respectively, sent me trees of Oldenburgh and Tetofsky. When these got fairly under way I found no need whatever to starve or to cut back. They grew according to their own sweet will, barring a little gentle guidance, and soon were loaded with abundant fruitage. Even the extra-hardy Talman Sweet, Fameuse, Yellow Bellflower and Red Astrachan of the catalogues had shown their inability to stand our highland temperatures; and this experience with the last-named had prevented me from having much faith in the alleged superior hardiness of the Russian Apples. But since then I have learned that, though Astrachan is a part of Russia, it is the extreme southern part, with winters little, if any, more cold than those of southern New England. It is only in central Russia, or about the latitude of Voronesh and Riga, that the true iron-clad tree-fruits of Russia are found.

Now, further observation has instructed me that there are other causes, besides extreme cold, which affect some varieties severely and others in the same place not at all. "Yellows" is not known, or is very little known, as a disease of the Peach in our southern states. The blight of the Apple-tree on the black prairie soils of Illinois and Iowa is a most destructive disease—as prohibitory in its effects as the severe cold of our northern mountains in regard to many varieties. Black-spotting of valuable apples, like Fameuse and its seedlings, is not remarked to a great extent in suitable localities. Fameuse Sucrée, for instance, or McIntosh Red, I can get from ninety miles away, near the St. Lawrence River, quite free from spotting, but I cannot grow them so. The weakening of the vitality of these trees by our greater cold, though it does not kill them, so affects them that they do not resist their fungous foe. I hear from many places in middle and southern Maine, where I have distributed cions of these excellent dessert apples, that they grow quite fair, and are likely to prove valuable acquisitions, worthy of extensive planting.

Now, reflecting on all these facts and taking full account of

what they may be made to teach, is it not probable that what we are asked to call the "running out" of varieties is simply a local yielding to unfavorable conditions of soil, temperature, or certain atmospheric conditions? May it not sometimes be justly attributed to erroneous methods of culture, or even to neglect? In the case of the apricot, for instance, is it not now plain that the reason why our eastern markets rarely exhibit them, after a hundred years of effort to grow them, is that we were trying to grow them on the wrong side of the continent? It seems to me that everywhere we must expect that under unnatural conditions no fruit-tree will long be able to maintain itself in perfection of growth and fruitage.

While these thoughts have been the direct result of practical experience as a grower of tree-fruits, in different localities, for many years, I do not want to put myself on record as entirely disbelieving the possibility of the deterioration of varieties under even favorable conditions. Some varieties must be weaker than others in constitution. We know this to be true of animals and may reasonably infer it to be so of fruit-trees. For instance, the Fameuse, though so long successfully grown on the Island of Montreal, is apparently going back on its record within the past ten years. Perhaps this may be owing to the growth of the city and the effect of atmospheric vitiation in consequence. We cannot be certain on any of these points, but I would remind your readers that these "run-out" sorts may often be capable of renovation through a mere change of conditions.

Newport, Vt. *T. H. Hoskins.*

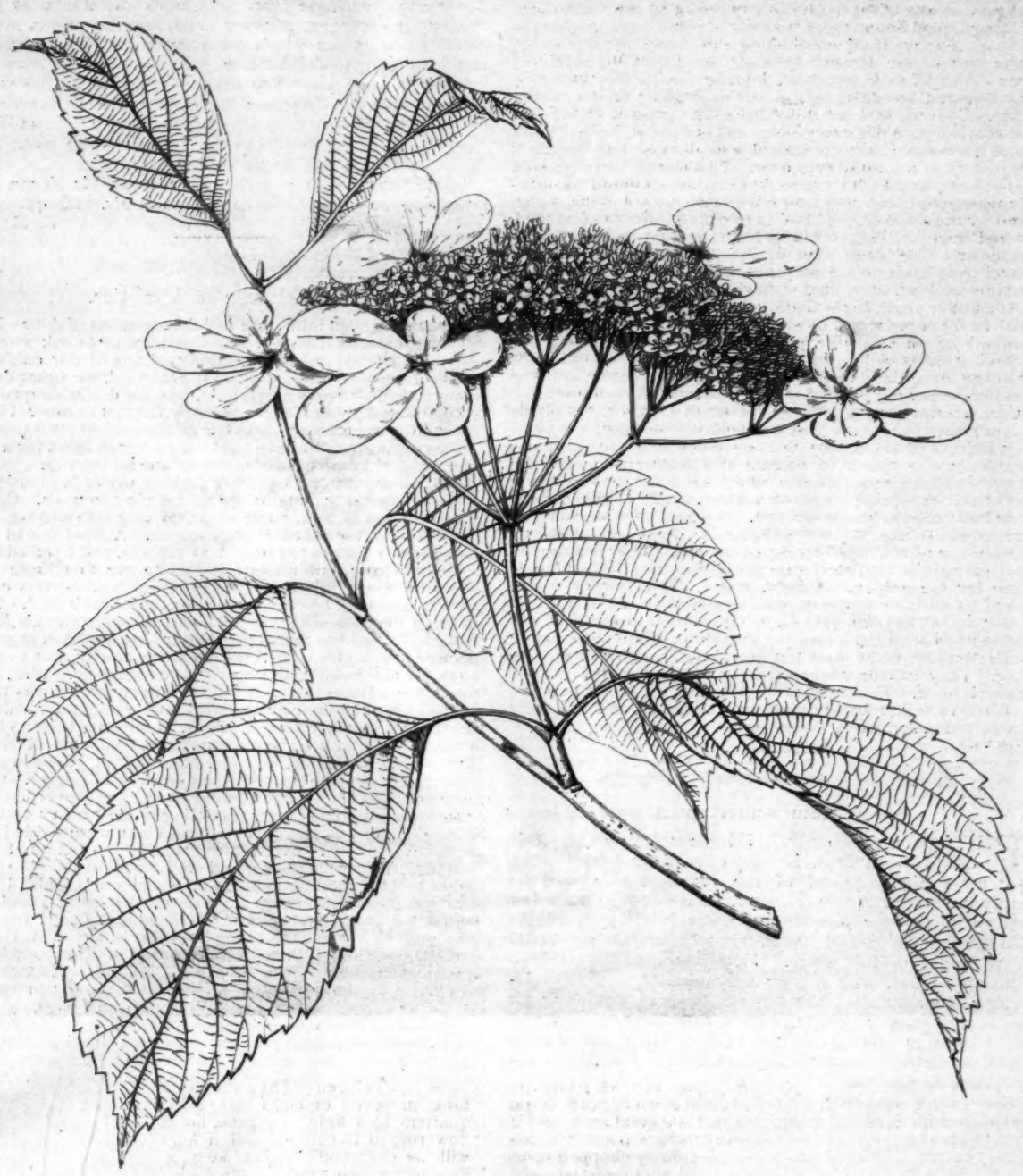

Fig. 93.—Viburnum tomentosum.—See page 593.

Cyclamen Persicum.

TO grow Cyclamens in perfection it is absolutely necessary to avoid all extremes in temperature. An equable moist atmosphere is the only condition under which the best qualities of these plants can be brought out. The Cyclamens being by nature woodland plants—that is, growing in groves, thickets or other moderately shady spots, where changes of temperature are not sudden—it is easy to understand why the plants thrive best in the surroundings above indicated. It is not always easy to guard against excessive heat during the summer months in this country, but by means of shading canvas, open-air cultivation and sprinkling of the ground about the plants, this can be accomplished well enough for ordinary practice.

Another important fact to be remembered is, that old seed is unreliable, and a greater difference in size will be observed in plants obtained from such seed than in a lot from fresh seed. Fresh seed should be sown, and sown as soon as possible after it can be obtained. August is a good time, and the seed should be sown in well-drained shallow pans in a compost of peat, sand and loam, with some finely chopped sphagnum added, and then lightly covered and kept moist by careful sprinkling. The pans should be placed in a frame in a temperature of no less than fifty-five degrees. If the seeds are fresh the young plants will appear in four or five weeks, and should be pricked off in shallow pans, with a somewhat richer mixture of soil, omitting the sphagnum. As soon as the plants have a few leaves, and are deemed sufficiently strong, they should be potted singly in two-inch pots, and all check to their growth should be avoided by keeping them in a temperature of fifty-five or sixty degrees, near the glass, moist and shady. Of course, they must be repotted as the roots fill the pots, every time in a slightly richer soil. Plenty of fresh air is necessary under all conditions. Early in spring the corms of the plants ought to be as large as a walnut and well studded with short robust leaves. Now, as soon as the weather will permit, put them out in the open air, in a shady position, and plunge them in a layer of sawdust or well-decayed horse-manure; if the latter, it must not be allowed to heat. All summer long the young plants must never suffer from want of food, water or air. A light syringing overhead every bright morning is advisable, and on hot days the ground around and the woodwork of the frame should be thoroughly soaked several times a day, to keep the air cool and fresh. A canvas shading stretched high above the plants, so as to prevent direct sun rays, but permit plenty of light and a free circulation of air, should not be omitted.

By autumn the corms should be about two inches in diameter, the sturdy leaves will cover the pots, and signs of flower-buds can be seen. They should now be potted for the last time, in seven or eight inch pots, removed to their winter quarters in a light, airy greenhouse. They will commence flowering in December, and, if kept cool, when in full bloom will, as everybody knows, keep a long time in perfection. Few plants can compare with a well-grown Cyclamen for lasting beauty, and even when most of the flowers are gone the handsome leaves are in themselves an ornament. I have seen Cyclamens kept in living-rooms and parlors a considerable part of the winter without losing their freshness and beauty; but care must be taken not to overwater them when in bloom. This is the time when the greatest caution in watering should be exercised, as Cyclamens, like most similar plants, flower during the drier season. It may be necessary to remind novices that the corm should not be buried, but that its upper half should be left above the soil.

New York. *N. J. Ross.*

Fig. 94.—Viburnum tomentosum in Flower.—See page 593.

Winter Gardening in the South.

THE longer I live in North Carolina the more I become convinced that our people hardly realize the great possibilities of winter gardening here. Of course every one knows that such hardy things as Lettuce, Kale and Spinach will grow thriftily here all winter, and many plants which can only be wintered with fire-heat at the north come through safely in a glass-covered pit. But few realize the amount of enjoyment that can be secured from a cold frame here on a rich bed of soil with no protection but the sashes. It is known that Violets, Roman Hyacinths and plants of equal hardiness can usually be had outside all winter, but now and then a cold snap spoils the blooms, and this danger can be warded off by a simple sash, and the flowers will be produced in great perfection. In a cold frame here, with no protection but the sashes, we bloom not only Violets and Pansies but Mignonette of a size never seen in a heated house, Phlox Drummondii of all colors, Petunias like Countess of Ellsemere; Candytuft, particularly the perennial, which often blooms outside as the Phlox does; and we can have Roman Hyacinths and Daffodils untouched by the frost, which frequently spoils them outside. With a little higher frame, to give head-room, Carnations bloom well, and Tea Roses like Safrano, pegged down, will give an abundance of buds. Even such flowers as can be expected in the open air are of much better quality under the sashes, and this superiority alone would be worth the little trouble and expense, especially as hot-bed sashes three feet by six can be had in Raleigh, glazed and painted, for $1.50 each.

It is not only in the flower-garden that this simple protection gives rich returns. Lettuce will grow outside in winter, but it is often scorched by frost, while a few sashes would give fine crisp heads. I have an experimental frame in which seventeen varieties are now growing. To my surprise, the sort known as All-the-Year-Round headed first, Yellow Seed Butter next and larger, with Prize Head close behind and better. The old Brown Dutch is also remarkably fine, and the Paris Green Cos has made fair heads without tying. Our old favorite, Boston Market, while heading well, does not compare with the others. Of the loose types the Black Seed Simpson is very fine. This Lettuce was sown October 1st and has had the sashes pulled over it only on two cold snaps, November 17th and 29th. As fast as the Lettuce is cut out, its place can be filled with later-sown plants from the open border. The first of January we will sow in frames Early Wakefield Cabbage, with Early Summer and Fottler's Brunswick for a succession. These will alternate in the frame with rows of Radishes. The Cabbage-plants will go into the open ground in February, and Tomato-plants from the greenhouse will take their place, and the Radishes will be used. At the same time the Cabbage-seed and some Onion-seed will be sown also in frames and transplanted outside in February, and then part of the frames will be used for starting the early plants of Sweet Potatoes.

The multitude of uses to which a simple cold frame can be adapted in a mild climate is a constant source of pleasure and surprise even to an old hand at the business. Our truckers do not use one-tenth part of the glass which they might use with profit. Most of them use none. The oiled cotton cloth commonly used for spring protection is a poor substitute for glass, and a gardener accustomed to glass soon votes the plant cloth a nuisance except for greenhouse shading. By the way, for a light greenhouse shading, giving a ground-glass effect, the best I have ever tried is two gallons of boiled linseed-oil, a half gallon of Japan varnish, and a half gallon spirits of turpentine, mixed, and applied with brush. The first rain turns the varnish to a milky color and breaks the glare without shading materially. I use it all winter.

Agricultural College, Raleigh, N. C. *W. F. Massey.*

Cattleya labiata.—This new old Cattleya, the rediscovery of which has caused such a sensation in Orchid circles, is now being distributed by several firms—a decided advantage to the purchaser, and, what is satisfactory to all, the supply does not seem to diminish but to assist also in the introduction of other new and desirable plants from the same district. In future, there is no reason why Cattleya-flowers should not be as plentiful in November as in the flowering seasons of *C. Trianæ*, *C. Mendelli* and *C. Mossiæ*, from early spring onwards. It was my privilege a few days ago to see some ten or twelve varieties in flower in the gardens of H. H. Hunnewell, Esq., at Wellesley. The plants in question were bought a year ago for *C. Warocqueana*, and are obviously the true *C. labiata*, and of the many plants in bloom no two were alike; all are distinct, resembling in this respect the favorite *C. Trianæ*. We are told that this Cattleya is easy to grow, and certain it is that owing either to the inherent vigor of the plants or Mr. Harris' skillful treatment, or perhaps both, all of them were perfectly happy and growing and flowering vigorously in their new home. One could not help wishing a long life to *C. labiata*, for the lives of some of the very best are all too short under cultivation.

Scabiosa Caucasica.—Now that the seed catalogues are in process of construction it may not be out of place to protest against the way that seeds of choice hardy perennials are persistently omitted. True, some of the commoner kinds are sometimes included, but for the really good and choice kinds we must send to the seed-growers in Europe, and these, in their turn, will sometimes refer you to their wholesale buyers here, whose lists, you know, do not contain the desired seeds, even if the dealers are aware of the merits of the plants in question. It is quite time that some firm here took up this branch of the seed business and made the fact known. There is no doubt that they would be supported by the flower-loving public now that perennial border-plants are better known than ever before. It was with considerable difficulty that I obtained seeds of *Scabiosa Caucasica* last spring, and they grew and flowered well. During the last week of November I was much surprised to see some of the bright blue flowers in the open border that had many times been frozen, but which were still unhurt. Many complain of this Scabious as being difficult to cultivate, but it is not so here. In moist heavy soil they thrive and bloom the first year, and are perfectly hardy, though the plant is said to be indigenous to arid places in the Caucasus and Armenia. Hardy, or even annual plants that possess this pleasing shade of lavender-blue are rare, and should be made the most of in gardens, especially where cut flowers are desired in quantity.

South Lancaster, Mass. *E. O. O.*

Rust of Carnations.—This fungus, *Uromyces caryophyllinus*, Schr., was noted in the last issue of the *Botanical Gazette* as having recently been brought to the attention of Dr. Arthur, of the Indiana Experiment Station, who, upon examination, found it already pretty well distributed in his state, "some large greenhouses not having a plant free from it." To-day a package of Carnation-leaves was received from a firm in Philadelphia, with an urgent inquiry as to the nature of the trouble that has come so suddenly upon their plants. That they were badly infested with a genuine rust was determined at a glance, and, upon a microscopic examination, it proves to be the same as reported so recently for Indiana. To florists who are interested in this new pest, that is, new to this country, for, like many other such fungi, it has long been known in Europe, it may be said that the trouble can be distinguished from any of the other fungous diseases of the Carnation by the medium-sized plump gray blisters produced upon the leaves, and the larger because longer ones, here and there upon the stems. Like the various other species of rust upon grains, grasses, etc., the mischief is largely done when these blisters appear. The fine threads have previously ramified throughout the plant and taken from it the nourishment that was afterward used up in producing the large crop of brown spores that are packed away under the skin of the blister. It therefore follows that when once a plant is badly rusted there is little hope of curing it. All diseased parts should be removed and burned, and with the worst cases the whole plant should be destroyed. With perfectly healthy plants it is probably true that the rust might be kept out by spraying frequently with copper salts. However, the disease is new to us, and we therefore cannot speak from experience. The chief point of this note is to call the attention of Carnation-growers to the widespread distribution of the new-comer that they may look for it and report new localities as they are found.

Rutgers College. *Byron D. Halsted.*

Spiræa Filipendula, flore pleno.—The plants of an attractive character which thrive in almost any position are none too numerous, and those we have should be known as widely as possible. The double *Spiræa Filipendula* is one of our most useful, and, at the same time, one of the most beautiful hardy perennials. It is equally at home in the rich soil of a border and the almost barren patches of earth which the crevices of a dry rockery afford, in partial shade and the full blaze of sunshine, in the city lot and the country garden. It is also a cheap plant—a plant that every one may have and grow. The species is a common European plant, with Fern-like foliage, which forms a dense mass of the richest green color. The charming clusters of small creamy white flowers are borne at the top of sparsely leaved, erect stems about two feet high. They ap-

pear early in June, and last nearly a month. The variety differs in having double flowers, and in blooming more freely. The flowers of the double form continue in a perfect state much the longest, and they are excellent for cutting, lasting from two to three weeks in fresh water. The stems should be cut away immediately after the flowers fade, and then the foliage will retain all its luxuriant beauty throughout the summer and autumn. The variety can be propagated only by division in spring and autumn; but seeds of the species are obtainable occasionally, and they should be sown under glass early in spring.

Thermopsis Caroliniana.—As the specific name implies, this excellent plant is a native of Carolina, the northern state of that name, where it is said to occur plentifully in the mountainous regions. The plant ranges in height from four to five feet, the unbranched stems bearing large ternate leaves of bright green color, and a terminal spike of showy yellow pea-shaped flowers closely packed around the stalk in a mass from six to nine inches in length. The flowers are very attractive in the mixed border during the month of June, and the plant blooms quite freely. The best position for it is the back line of a narrow mixed border or the centre of a broad bed or border in which the plants decrease in stature to more sides than one. I have seen a large mass of it planted in an isolated and fully exposed position, but it is more striking than beautiful in this way. It is more effective when planted in strong clumps among other plants of similar size and contrasting colors, and the flowers light up the dark green of dull shrubberies wonderfully while they last. The various stems of each clump should be loosely secured to a stout stake in the centre when they become too long to stand against wind and heavy rain, but established plants may otherwise be safely trusted to care for themselves. It is not exacting in its requirements as to soil, and is often found in luxuriant health where many plants of similarly robust appearance would certainly succumb. The large crop of seeds ripened annually afford a ready means of propagation; but they are, however, slow to germinate, and should be raised in heat during early spring.

Cambridge, Mass. *M. Barker.*

The Forest.

The Subjection of Torrents by Reforestation of Mountains.—II.

CÉVENNES.

THE range of the Cévennes is formed by a series of massive, but less rugged mountains than the Alps or the Pyrenees. These mountains are veritable fountains of water, and the rains there fall in deluging showers, such as are seen nowhere else, and all the waterflow there is eminently torrential. It is usually in September that these terrific water-spouts are formed, when the mountains (relatively slightly elevated) are unable, as in the Alps and Pyrenees, to store a part of the precipitation in the form of snow.

As a consequence of the orographic arrangement of the ground, the valleys are continuous, and do not empty, as in the Alps, directly and abruptly into an alluvial plain. Thus one never finds there, even among the most powerful and erosive streams, the great cones of eroded material so characteristic of the mouth of torrents. The transportation of the materials which they bear, after having torn them from the mountains, continues in the torrential river, whose channel becomes wider and wider as it fills up, more erratic and hence more dangerous for the rich farm-lands or the great industrial centres in the lower valleys.

The absolute denudation of the summits and of the higher basins is characteristic of this region. Forests there are still more rare than in the Alps; the slopes are there furrowed by a series of torrents side by side, and by myriads of deep and yawning ravines, even on the most gentle inclinations.

THE PYRENEES.

The chain of the Pyrenees is a geographic unit clearly defined. It includes a variety of climates less complete than the Alps, but having this inestimable advantage that limestone is replaced in great part by igneous rocks, which are more solid and less easily eroded. The general exposure is toward the north, and rains are copious and frequent. The forests, as well as the pastures, reach over vast areas, and are in a comparatively good state of preservation.

The torrent is only found here as an exception, but an exception that will become general if no restraint is placed upon it, and the Pyrenees would suffer what the Alps have undergone, notably in the upper basins of Gave de Paul, the Garonne and the Ariège. The remembrance of the inundation of 1875 is still thrilling, and the activity of certain torrents shows a disquieting tendency to increase. It is characteristic of this region that the active torrents are all of recent formation, most of them having arisen within our own memory.

A comparison of the three regions leads to these conclusions: (1) That restorative work in the Alps will demand far more energy and expense than in the two other regions combined; (2) That in the Pyrenees the important work of correction could be carried through in a relatively short time, and that reforestation there would not be necessary over any great areas; (3) That in the Cévennes a long series of small corrective operations should be carried on in connection with the creation of great masses of forest at the sources of the innumerable streams which descend both toward the ocean and the Mediterranean; (4) Finally, the Alps require the greatest as well as the most numerous corrective operations; and in most of the higher basins a reforestation so complete as to hold in constant subjection the formidable torrents which threaten to make a very desert of the frontier so important to south-eastern France.

SUMMARY.

These works for the public safety are needed in seventeen departments where torrents develop full activity, but adjoining districts also need the benefit of the law, and it would be well if at least one-third of the entire area of France should be made the theatre of "permissible treatment" by the government.

From the beginning of this century means of defense against torrents have been studied.

In articles on this subject engineers have usually confined themselves to the question of the regulation of the deposit of material loosened by the streams, and its retention within the gorges or at the point where they empty into the valleys. But these studies and plans aimed solely to diminish the ravages of the torrents; no one even dreamed of suppressing them entirely. Surrell first introduced the idea of fighting torrents to their utter extinction.

After having discovered by a series of precise observations the causes of the formation and the action of torrents, as well as the causes of the quieting or the extinction of certain ones among them, he set forth the following propositions:

1. The presence of a forest on a surface prevents the formation of a torrent.

2. The clearing away of a forest renders the soil a prey to torrents.

3. The development of forests leads to the extinction of torrents.

4. The felling of forests increases the violence of torrents, and may even cause them to be renewed.

Experiments were carried on during thirty years by foresters over all the mountainous regions of southern France. Innumerable observations, made in the mean time, on the unexpected appearance of new torrents and the influence of existing forests in the same regions, and the definite extinction of a great number of torrents, even in this short period, have fully demonstrated the immovable solidity of these fundamental principles in the great enterprise of the restoration of mountain lands.

As Surrell has said, "Nature, in clothing the mountains with forests, placed the remedy by the side of the danger; she opposes the active forces of the waters with other active forces from the kingdom of life. Ineffectual, indeed, are all our efforts beside these great remedies which Nature dispenses and patiently uses through the centuries! Our paltry works are only defenses, as their name indicates; they are passive masses opposed to active forces, inert obstacles in opposition to eager forces which are always aggressive. Why, then, does not man utilize these living forces to suppress torrents at his will? The fundamental problem is simply to find the best means of covering with a mantle of vegetation the lands ravaged by torrents now or threatened by them in the future. The defense must not begin in the lower reaches of the streams; these will defend themselves as the conditions above are corrected. The real warfare must be carried into the higher regions of the mountains. Every system of defense which does not first check the erosions in the mountain will always remain incomplete."

These ideas were not shared by all. Eminent engineers divided torrents into two classes: the curable ones, which they thought might be subdued by reforestation; and the incurable, whose basins did not seem susceptible of being covered with trees. The first class they would commit to the foresters, the second to engineers. The Legislature did not

admit this classification, but entrusted to the foresters the bold mission of reclothing the mountains, under the inspiration of Surrell, the apostle and master of this wise and beneficent policy.

THE EXECUTION OF THE WORK.

In an enterprise without precedents the best guide was indisputably the "Study of Torrents," by Surrell; but, notwithstanding the correctness of its principles, the task was, at the outset, beset with difficulties, and at times, it seemed, with impossibilities. It is small wonder that the engineers considered many of these torrents invincible. The impression produced by the sight of these devastated regions is a sort of stupor, or, at least, of discouragement, which makes one doubt the power of man in the face of such disasters. But if we analyze the conditions with care—if we compare the land in question with other regions less devastated or still wooded—if, finally, we study precedents which exist, although on a very much reduced scale, we shall feel confidence in the means of regenerating the mountains, which man alone has brought to a state of apparent ruin. This re-assuring faith which inspired the foresters was well expressed in the beautiful aphorism of Viollet-le-Duc, in his work upon the grandeur of Mount Blanc: "In Nature there are no little forces, or, rather, the work of Nature results only from the accumulation of little forces. Man is, therefore, able to act his part, since these little forces are under his dominion, and his intelligence enables him to appreciate their effects."

It was indispensable for the foresters to begin cautiously, and to try first a series of experiments of a duration and of a magnitude sufficient to enable them afterward to adjust the remedies to the extent of the evils to be corrected. Their first efforts were to create forest-masses on the denuded slopes, and it is only casually, and on certain small typical torrents, that cautious corrective trials were made, from the results of which a series of well co-ordinated observations was to be built up as a basis for the treatment of greater torrents. Having become familiar with the kind of dangers to be met, and once armed by long study and observations, they dared to assault resolutely the most formidable torrents. It is thus that in the lower Alps the correction of the torrent of Labouret, subdued after eighteen years, furnished a complete series of most valuable observations. It only remained to use the principles thus established in treating the great torrents of the valley of the Ubaye, the extinction of which, begun in 1872, is to-day accomplished.

The experimental methods in the Alps of upper Provence were ultimately applied in Savoy, Dauphiny and the Pyrenees. Everywhere they have given the quickest, the most economical and the most conclusive results. We possess at present, therefore, all the most desirable and most varied experiences in all the kinds of work that may be necessary for the extinction of the greatest torrents.

I will not detain you to describe the divers operations executed throughout our field of action, but I desire to deduce from these experiences of more than a quarter of a century the principles which have been justified by facts.

The method of treatment is based ultimately upon the entire reforestation of all the tributaries of each basin susceptible of being eroded. The forest, thus re-established in its natural place in the upper basins, is alone capable of insuring the ultimate extinction of the torrent by maintaining forever the beneficent effect of corrective works which are temporary and precarious at best. These works, in fact, have usually proved ephemeral, except certain great works of unusual importance, which, kept up by proper repairs, will be found in the future the only witnesses of the first temporary construction by which the forest will have profited to establish itself firmly and develop vigorously, until its perpetual vitality is finally substituted for inanimate works. The regular course pursued is as follows: (1) A survey and map of the boundaries of the lands to be reforested or to be kept wooded in the basin of the torrent; (2) Reforestation, as prompt as possible, of all the stable lands within the boundaries; (3) The fixing of the unstable lands by corrective works; (4) Reforestation of unstable lands as soon as they become fixed; (5) Finally, the selection of the engineering works which it will be necessary to preserve in the future.

On the side of sylviculture, the first question to consider was to know whether forest-vegetation could be introduced into altitudes much above that of the actual forests. Upon the solution of this primary question depended in most cases the justification of the method, because a great many of the larger torrents have their origin in altitudes of nearly 3,000 meters, while the actual forests hardly reach 2,000 meters.

It has been made a rule to stop only where the snow lies for several consecutive years, and we have sowed or planted, as the case demanded, either Larch or Cembran Pine. Each Pine or Larch becomes the centre of a circle of herbaceous vegetation, increasing spontaneously from year to year, following a law of selective association, which impresses every observer. In a little while the mountain recovers its double helmet of forestal and herbaceous vegetation, and nature regains her rights.

The reforestation of stable lands may be accomplished in a very few years. If care is taken to prepare at the outset the nurseries necessary for the different altitudes it is possible to attack in the same year all the different climatic zones in their most favorable seasons. At great altitudes special nurseries may be dispensed with if some small grassy plats are provided. It will suffice at first to sow appropriate seeds very thickly, which at the end of four or five years furnish myriads of plants that may be taken up and set out with pieces of sod, a course that would hardly succeed with plants from a cultivated nursery. Seedlings thus produced may be kept until seven or eight years old, to use in banks and crevices, where the young plants run great risk from stones brought down by the melting snows and the hail-storms. Years of experience justify the utmost confidence in our ability to reforest stable lands.

The unstable lands usually occupy the steep banks of the torrent or the slopes immediately above them. This instability is nearly always due to erosion by the torrent, sometimes longitudinal, and again lateral, by cutting under the bottom of slopes, which induces destructive landslides.

When the slide is over, the earth is left in the form of a series of shelves or steps, at the bottom of which the soil has a slope opposite to that of the general surface, and the result is a series of depressions, into which the snows are drifted by the winds. In spring the water from the melting sinks into the fissures, saturates the earth, and thus causes the formidable slipping away of entire mountain flanks or enormous washes of mud in certain sections. It is in these sections that corrective operations act the most important part.

Correspondence.

The Great Wurtemberg Linden.

To the Editor of Garden and Forest:

Sir,—In one of the August numbers of Garden and Forest you mentioned the remarkable Linden of Neustadt, in Wurtemberg, and the readers of your journal may take some interest in learning a few more facts concerning this giant, which can rival some of the Big Trees of your Pacific coast, if not in height, at least in the size of its trunk, and in age.

Mr. Falter, a resident of the said town, writes as follows on this subject:

In 1867 the trunk was described as having a diameter of twelve feet and a circumference of thirty-seven feet. The botanists Kemmler and Von Martens, in their flora of Wurtemberg, published in 1882, gave a circumference of forty-two feet. In reality these dimensions are difficult to verify, because the main trunk is surrounded with a solid wall of support two feet in height. One of the principal branches, which threatens to fall off, is likewise protected by a wall, and these make measurement impossible. The height of the trunk to the branching is only six feet. The branches extend horizontally over the ground. Eight young Lindens have been planted at different times to fill the gaps in the dome of verdure of the principal tree. The total height of this is to-day seventy-two feet. On June 17th, 1773, a storm broke off one of the two vertical branches at a height of thirty-two feet from the base. The scar is now well covered with a new bark, but the tree suffered greatly by this amputation. On July 18th, 1847, during a hard tempest, the second vertical branch was broken thirty feet from the trunk, and this grave wound is seen very plainly through the foliage, and will never be cured. The diameter of the whole crown, from one extreme branch to the other, is 114 feet. The original trunk and the principal branches are filled with masonry in order to delay the destruction of the tree, which is visibly approaching, for in many places the sap has ceased to circulate. The tree belongs to the species *Tilia grandiflora*, Ehrhart, while the trees planted around it are *T. parviflora*, Ehrh. The columns intended to support the horizontal branches of the tree still exist to the number of ninety-eight, ninety being of stone and eight of wood. A few are no longer in their places. Kemmler and Von Martens add, that this Linden marks the place of an ancient tribunal which was held in the open air. Indeed, everywhere in Germany during

the Middle Ages it was under the shade of Lindens that the people were accustomed to assemble and discuss matters of public interest.

The age of this tree is believed to be about 700 years.

The fact that a place which is the capital of a district has the name of a tree added to its official designation, "Neustadt-by-the-Linden," speaks sufficiently for the size of the latter.

Of the two species, it is *T. grandiflora*, Ehrh. (syn. *T. platyphyllos*, Scop.), which produces the largest trees, and Wurtemberg can boast of possessing the very largest of all. Another large Linden is standing near Leukirch, while at Isny there is one thirty feet in circumference and ninety-five feet in height. Such trees are supposed to be more than 600 years old.

Basle. *H. Christ.*

Damping Off.

To the Editor of GARDEN AND FOREST:

Sir,—This subject, recently (November 18th) discussed in GARDEN AND FOREST by Professor Halsted, is of such profound interest to propagators and growers that it would have been instructive had he given in his article a synopsis of the methods he employed to determine the existence of the fungi which he discovered in the seeds of Beans that he tested for that purpose the past season. It is clearly of the first importance to know decisively and incontrovertibly if the disease does have its genesis in the seed or in the soil, as the best methods of combating it for one is inapplicable to the other. If in the soil, thorough roasting of the soil of seed-beds, boxes or pans will be all-sufficient. If inherent in the seed, we must have recourse to germicides.

I have subjected various tree-seeds to close microscopic examination, failing even in the dust which lodges upon rough-coated pericarps to find an appearance of micro-organisms. The same lot of seeds germinated in moistened cotton exhibited no fungoid tendency, but, sowed in good loam, damped off at an alarming rate. The recommendation of some works on gardening is to use for seed-starting leaf-molds, peat, rich garden-soils or various composts of the three.

Such soils, rich in nitrogenous compounds, furnish the best possible vehicles for the rapid development of the disease.

Another practice much in vogue and equally pernicious, is the "riddling" or fine pulverization of the soil. The necessary sprinkling tends to further disintegrate the fine particles of the soil and resolve the surface into a nearly air-tight skin, prejudicial to seed-sprouting and favorable to fungoid life.

The so-called mineral soils, such as limestone, decomposed granite, and even clays, reduced to a proper mechanical condition by admixture with sand, I have found excellent media for this purpose. With these, when thoroughly roasted, I have so nearly attained immunity from damping off, that I have small faith in the notion that the disease originates or exists within the seed, except in isolated cases.

The stress with which Mr. Halsted urges the necessity of having "a healthy soil" for such operations, exactly falls in line with my own observations, and, I think, covers the whole field.

If his postulate of the inherency of disease in the seed holds good, no amount of health in the soil will help us, not even purification by fire, and we must have recourse to antiseptics.

California Experimental Forestry Station. *Wm. S. Lyon.*

Are Large Strawberries a Modern Production?

To the Editor of GARDEN AND FOREST:

Sir,—In the "Quadripartitum Botanicum," by Simon Paullus, a Dane, in 1708, the author says he has seen a variety of Strawberry, of the kind Bauhin calls Prune-sized, which produced a fruit nearly the size of a peach. I give the original Latin, on account of the interest:

"Vidi enim eam Fragariæ speciem, quam Bauhinus: *Fragariam fructu parvi pruni magnitudine* . . . fructum produxisse, ut fere æquaret magnitudinem mali Persici, nondum perfecte maturi, cui tamen similis altero anno."

South Framingham, Mass. *E. Lewis Sturtevant.*

Periodical Literature.

The December number of the *Overland Monthly* contains an interesting illustrated article on Flower and Seed growing in California. The growing of seeds for commercial purposes is quite a recent industry, and even the California Poppies which have been planted in gardens there were often raised from seeds which have been imported from Europe. This plant, both in eastern states and in Europe, is said to be inferior in the size and color of its flowers, and hence the Poppy grown from foreign seed in California is not so beautiful as the wild plants in the fields. The bulbs of the Mariposa Lily, or "Butterfly Tulip," however, have been for some time articles of export, a single collector in Ukiah selling 100,000 every season. These have not yet begun to return to California from the bulb-growers of Europe. However, a glance at the catalogue of European florists shows Scarlet Larkspur and Lobelia, elegant varieties of Dodecatheon, Brodiæa, Mimulus, Ceanothus, Phacelia, Azalea, Rhododendron, Clematis, and a late acquisition—the Scarlet Perennial Pea. Lily-bulbs, too, and many wild plants are collected here for European commercial establishments. Californians have discovered also that they can grow seed and bulbs of many plants which are not native, so that Onion-seed and Tuberose-bulbs are sent to the east in carloads. The trade in cut flowers is much more local, but two carloads of Orange-blossoms and Callas were sent to Chicago last April. The stems of the Orange-flowers were first dipped in wax and afterward placed between layers of moist cotton. Thirty-five thousand Calla-blooms were placed in wet sawdust, with their heads supported by damp moss. This suggests a new way of disposing of the flowers of the Calla, which is most prolific here although it is raised chiefly for local ornamentation and for the shipment of its tubers. The picture of a Calla field in bloom reminds one, by its shining whiteness, of the great fields of Lilies in Bermuda, only the Callas are grown here on a larger scale. Another industry is found in the Pampas plantations of Santa Barbara, where this tall grass is grown in rows from ten to fifteen feet apart. The second year each stool will produce from fifteen to a hundred plumes on stalks twenty feet high, and in 1870 they were in demand at from $50 to $60 a thousand. The average wholesale price, however, is $30 a thousand. An acre has been known to yield 10,000 plumes a year. England and Germany send the largest orders for these plumes. The latest development of floriculture is seen in the Rosalita Farm in Los Gatos, where the manufacture of the essential oils of Rose and Geranium has been put to practical test with gratifying results. Ten thousand Rose-bushes were imported directly from Grasse, and a still was brought over from France. The essential oil, which floats on the surface of the water from the condensed steam, is the attar of Rose, which needs only settling to be ready for market, while the water accumulated in the reservoir is soft and fragrant and sells on the place for $1.75 a gallon. Besides Roses there are acres of Geraniums, Cassia, and a peculiar species of Orange-tree used only for its flowers.

The sale of cut flowers in California is very large. The Violet is the most prolific flower which bridges the gap between the fall Chrysanthemum and the early spring firstlings of the nursery. At Sherwood Hall there are five acres of choice varieties of Violets growing thriftily in the rich leaf-mold in a grove of gigantic Oaks. The rows of plants reached up to the very trunks of the trees. The work of picking these flowers is left to Chinamen, who are kept busy for six months of the year, and every morning the crop is sent to San Francisco. Sweet Peas are another specialty in this nursery, and transportable flowers, like the Violet, the Aster, Chrysanthemum, Tuberose, with thousands of varieties of Maiden-hair Ferns, are sent to Tacoma, Salt Lake, and even to Chicago.

Many women in California gain a livelihood by raising flower-bulbs and seeds for market, and many others send huge hampers to San Francisco every day of wild flowers and ferns which have been picked from the neighboring cañons. Mrs. Theodosia Shepherd, of Ventura, stands foremost among these successful floriculturists, although only eight years have passed since, without means and broken down in health, she grew her first seeds for market in the old mission town of San Buena Ventura. She now fills orders from prominent eastern florists, with occasional calls from Europe, Australia and the Sandwich Islands. Her gardens comprise eight acres of fertile soil, which are under her personal supervision. She grows all the new seedlings among the French Cannas, for example, and one of her own called Ventura, which is said to be as large-flowered as the famous Star of '91. Last year she harvested 160 pounds of Smilax-seed, which were packed and shipped by Mrs. Shepherd and her three daughters.

Notes.

In the address of Mr. James Fletcher, President of the Association of Economic Entomologists, it is stated that insects cause the enormous loss of $380,000,000 annually to the agricultural products of the United States; that is, more than a

million dollars every day. It should be added that investigations in economic entomology, during late years, have given the farmers of the country the means of successfully combating the most destructive of these insect pests.

More than 200,000 sacks of Lima beans are piled up at Ventura, California, waiting for better prices. A year ago these beans brought five and six cents a pound; this year only two or three cents are offered.

To a correspondent who asks if the Jerusalem Cherry is a suitable plant for a window-garden, we would say that this fine old-fashioned plant is really one of the very best of house-plants. It is handsome, and can be grown with very little trouble. Visitors at the late flower-show in New York will remember a row of these plants about the fine mass of Cannas exhibited by Mr. Dean. For a border of this sort, and for many other kinds of decorative work, the Jerusalem Cherry is invaluable.

On the Experiment Grounds of the United States Government at Medicine Lodge, Kansas, forty acres of land were plowed and then subsoiled to a depth of eighteen inches and planted with Sorghum cane, and another piece of ground was plowed to the ordinary depth and planted to cane of the same variety without subsoiling. Both fields received the same cultivation, and the subsoiled land yielded eighteen tons of cane to the acre, while the best yield of the other ground was only ten tons.

When ground is cleared for agricultural purposes in California the standing trees are sometimes removed by the aid of explosives. By removing a little dirt from around the tree the position of the main roots or the tap root can be located, and a hole is driven along the tap root or between the principal roots with a long crow-bar, and this is charged with dynamite. Sometimes dynamite is placed in an auger-hole bored into the main root. After the explosion the tree falls, or the earth around it is so loosened and thrown out that it is not difficult to finish felling the tree.

A correspondent of the London *Garden* writes with enthusiasm of the beauty of a second flowering of *Daphne Cneorum* in mid-November, and, truly, it is difficult to say too much of the delicate charm of this little plant even in our colder climate. After occasional blooms through the summer its autumn crop of flowers is sometimes quite abundant here also. Even as late as the 12th of December, this year, it was blooming in the neighborhood of New York, opening its flowers perfectly and giving forth a fragrance which seemed even richer than that of its spring bloom.

The Oak-leaved Hydrangea in Georgia and northern Florida, where it is native, sometimes reaches a height of fifteen or eighteen feet, with a habit almost tree-like. It is not perfectly hardy, however, north of New York, and in cultivation in this neighborhood it rarely attains large proportions, although it is beautiful both in leaf and in flower, and its foliage in autumn turns to a rich claret color. Mr. Meehan states that one of the finest specimens of this plant is growing in the old garden of Washington at Mount Vernon, where it was planted by Lafayette. If this is true, this specimen is probably one of the oldest in cultivation.

The pavilion planned by the State of Florida for the Chicago Exposition grounds will reproduce Fort Marion, supposed to be the oldest structure in the United States, which was built at St. Augustine by the Spaniards in 1620, the year when the Pilgrims landed at Plymouth. The reproduction will be constructed of wood, but covered on the outside with Florida phosphate rock, simulating the original stone work, this use of the material constituting the phosphate exhibit of the state. The deep moat which surrounds the old fort will also be reproduced, but will be utilized as a sunken garden, in which plants native to Florida may be shown.

Some twenty-five years ago there was a great impetus to fruit-growing in western New York, and in order to get as much as possible from the ground, Apple-trees were planted at about thirty feet or two rods apart each way. Now that these trees are of full size it is hardly possible to raise a ladder between many of them, and good judges think that much of the imperfection and lack of color in the fruit this year can be attributed to the fact that the proper amount of air and sunlight has been excluded. Mr. Irving D. Cook, of Geneva, New York, writes to the *Rural New Yorker* that in the judgment of the best growers in that region forty feet, or even forty-five feet, is not too far apart for planting Apple-trees, especially trees of winter varieties, if the best fruit as regards size, color and flavor is to be expected.

Smith, in his "Dictionary of Economic Plants," makes the following statement: "In a volume containing a miscellaneous collection by Dr. Richard Pocock, in the British Museum, is the copy of a letter written by Philip Herbert, third Earl of Pembroke, Lord Chamberlain, to the Sheriff of Staffordshire. It is as follows: 'Sir—His Majesty, taking notice that the burning of Ferne doth draw down rain, and being desirous that the country and himself may enjoy fair weather as long as he remains in these parts, his Majesty has commanded me to write to you to cause all burning of Ferne to be forborne until his Majesty be past the country. Wherein, not doubting the consideration of their own interest, as well as of his Majesty's, will invite the country to a ready observance of this his Majesty's commands, I rest, your very loving friend, Pembroke and Montgomery.'" Here is a hint for some of the rain-makers of our Department of Agriculture.

It is well known that among the prizes which Egyptian monarchs brought back from their foreign wars were exotic plants of many kinds, and that even large trees were transported for long distances to be set up in the courts of the temple-palaces. In Miss Edwards' new book, "Pharoahs, Fellahs and Explorers," we may find an account of such transportation illustrated by interesting pictures copied from the bas-reliefs of the great temple built by Queen Hatasu, near Thebes. In several of the best-preserved pictures we see the Egyptian sailors carrying half-grown saplings which have been taken up with a ball of earth about the roots, and are being transported in baskets slung upon poles, each pole carried by four men. Over the saplings is inscribed *Nehet Ana*—that is to say, the Sycamore of Ana. Elsewhere we see the full-grown trees. The trunk is massive, the leaf is a sharp-pointed oval, and at the junction of the trunk and the larger branches are seen little copper-colored lumps of irregular form, representing the resinous gum which has exuded through the bark. A passage in Pliny . . . shows that this tree, the odoriferous Sycamore, can be none other than the Myrrh-tree, whose gum was brought by the ancients from the so-called land of the Troglodytes, and, especially if of the green sort, was highly esteemed by the ancients as the material from which incense was made.

A pamphlet prepared by Dr. E. M. Hale, of Chicago, has just been published by the Department of Agriculture on the history and uses of *Ilex Cassine* (*I. vomitoria*). It is from this plant that the decoction known as "black drink" was made by the Indians of the Atlantic and Gulf states, and this paper contains much curious information about its ceremonial and economic use by the aborigines. The most interesting point brought out is that an analysis of the plant by Professor Venable, of the University of North Carolina, shows that it contains caffeine, so that this is really an aboriginal North American Tea-plant. Another species of Holly, *I. Paraguariensis*, furnishes the maté, or Paraguay tea, so that it is not surprising that this Yaupon, or Cassena, contains a similar alkaloid. Professor Venable's analysis of other plants of this family in North America shows no trace of theine or caffeine. Dr. Hale quotes many interesting passages from early writers to show the extended use of the Yaupon by the Indians. The leaves were roasted and kept in dry places, and there can be little doubt that it was an article of commerce, collected by the savages on the coast of North Carolina and sent to more western Indians and sold. Dr. Hale finds that an infusion of Yaupon-leaves boiled for half an hour gives a dark liquid like strong black tea, with an aromatic odor not like coffee, but more like Oolong tea, although without its pleasant rose odor. The taste is like that of our inferior black tea, quite bitter, and with little delicacy of flavor. It is not an unpleasant drink, however, and Dr. Hale thinks that one might become accustomed to it as to maté, tea or coffee. The Indians used to say that the drink prevented hunger and thirst, and the similar effect of Coca-leaves, used by the Peruvian Indians, has brought that plant into medical use. One author states that the Indians transplanted—that is, cultivated—this Yaupon. Dr. Hale concludes that a beverage which contains caffeine should fall into disuse and become forgotten is a singular fact. If it has any economic value the plant could be cultivated over a large section of the southern coast country, and would produce an enormous crop. Dr. Hale states that it does not grow more than twenty or thirty miles from the sea-coast, and that its western limit is found about half-way from the Louisiana line to the Rio Grande. A note from Professor Pammell, however, states that he has seen it at least a hundred miles from the coast in Texas, and in the "Silva of North America" (I., iii.) it is said to penetrate the interior to southern Arkansas and the valley of the upper Rio Blanco, in western Texas.

Garden and Forest for 1892.

THE fifth volume of GARDEN AND FOREST will begin with the number for January 6th, 1892. During the coming year the same high standard and variety will be maintained which have given to GARDEN AND FOREST an unrivaled position among horticultural journals. It is recognized, at home and abroad, as one of the foremost periodicals of the time. Its scope is comprehensive. It treats of the art and of the science of gardening. It considers all subjects interesting to horticulturists, landscape-gardeners, students of garden plants, lovers of nature, and owners of country homes in all parts of the American continent. It is the only journal published in the United States which discusses comprehensively questions relating to our forests as they affect the welfare of the individual and of the nation. It keeps its readers informed of all that is novel and significant in the forests and gardens of the world. It illustrates new and rare plants, and its pictures of garden and natural scenery are believed to be unequaled by those in any journal of its character. Among its regular contributors are the foremost botanists, horticulturists, landscape-gardeners, and the most successful and experienced practical gardeners in the United States. Many distinguished foreign experts contribute to its pages.

GARDEN AND FOREST is under the editorial direction of Professor C. S. SARGENT, of Harvard College, assisted by Professor A. S. PACKARD, of Brown University, and Professor WM. G. FARLOW, of Harvard College.

THE OPINION OF REPRESENTATIVE READERS.

Very attractive in appearance, of delightful variety, and of unchallenged authority—*George William Curtis.*

The very best of all the periodicals of its class coming to my table. I would rather lose all the others than it.—*C. L. Watrous, late President of the American Association of Nurserymen.*

Deserves the support of all lovers of the floral kingdom, and I believe that it is doing a public service in practical suggestions for the preservation of our forests, a matter of supreme importance to the American people.—*Rev. Morgan Dix, D. D.*

It appeals with equal force to practical horticulturists and botanists pure and simple.—*George Nicholson, Supt. of Kew Gardens.*

It is aiming to conserve all large and best interests by making all that is good in the present a basis for much that will be better in the future. If GARDEN AND FOREST had no other virtue, it would be entitled to the support of all who desire the welfare of the nation, for the efficient service which it is rendering in working for the preservation of our forests.—*Rev. Lyman Abbott, D. D.*

Is taken in my family and read with much interest by us all. I consider it one of the very best publications of the kind I have ever seen.—*Senator George F. Edmunds.*

GARDEN AND FOREST is one of the most intelligently edited, most refined and most able of current periodicals. It is surely one of the best teachers in matters of taste that we have ever had in this country. In its special branches it not only teaches the public but teaches the teachers.—*Richard W. Gilder, Editor of The Century.*

A publication of the highest value in its department, and an honor to the periodical literature of this country.—*Francis Parkman.*

SOME RECENT PRESS COMMENTS.

For the enlightened owners of gardens and woodlands this publication is invaluable.—*N. Y. Tribune.*

The distinction of its writers in their various fields has stamped this journal with a peculiar authority.—*Philadelphia Public Ledger.*

Its contents are original throughout, and its leading articles always combine research and scholarship.—*Cincinnati Commercial-Gazette.*

Its literary quality is a noteworthy feature of the journalism of the day.—*The Critic, N. Y.*

The foremost journal of its class, keeping in touch with every advance in the scientific, artistic and practical phases of horticulture and arboriculture.—*Boston Herald.*

Faultless in mechanical make-up, edited with rare ability and care, written throughout in a polished style seldom found in the best periodical literature, it is doing a great and useful work, and is doing it splendidly.—*Philadelphia Press.*

It continues on its high level—its highest level, for it has no peer. It appeals, as mere literature, to every cultivated person, and is full of information for the lover of flowers and trees.—*N. Y. Evening Post.*

Its arrival is the coming of a wise and intelligent and entertaining friend whose stimulating conversation is of topics that never tire and always refresh—a friend who enables us to live more happily because more harmoniously with nature.—*Harper's Weekly.*

Its character is at once dignified and pleasing; that is, while the contents are scholarly and scientific in the exact sense, they are of a nature to interest the layman, and attract him to the serious study of what has been before but a pastime.—*Chicago Evening Journal.*

GARDEN AND FOREST, a weekly illustrated journal of Horticulture, Landscape-Gardening and Forestry. Subscription price, $4.00 a year, payable in advance. Postage to foreign countries in the Postal Union, $1.04 additional. Single copies, 10 cents each.

Address, GARDEN AND FOREST PUBLISHING CO.,
TRIBUNE BUILDING, NEW YORK.

AUSTRALIAN TREE FERNS.

Dicksonia Antarctica.

In all first-class greenhouses and floral shows this handsome and most distinct Tree Fern attracts immediate attention. Nothing could be more graceful or more decorative. The elegant airy fronds, sometimes four and six feet long, and two to three feet wide, have the appearance of the most delicate lace-work, waving in the air to the most gentle breeze. For the decoration of the vestibules of large mansions, this is eminently suitable. For conservatories, large plants will be highly appreciated, as the heavy stems can be covered with smaller Ferns, Platyceriums or Orchids.

We have a number of extra heavy fine **Dicksonias**, varying in height from one foot to three feet. All these are well established and sending out fresh crops of leaves. Prices, $4 to 15.

DICKSONIA.

CACTI.

Eminently suitable for indoor decoration during winter. They require absolutely no care. Our collection is undoubtedly the finest and largest in the United States.

To those who mention GARDEN AND FOREST we send, free of charge, our "Hints on Cacti," 116 pages, 180 illustrations; also our Catalogue.

A. BLANC & CO., 314 North 11th St., Philadelphia, Pa.

JOHN LEWIS CHILDS

HAS ONE HUNDRED AND FIFTY ACRES IN FLOWERS.

THE LARGEST STOCK of GLADIOLUS, LILIES, DAHLIAS, Etc., in the country. Come to Floral Park and see them for yourself. Our complete Catalogue of HARDY BULBS AND PLANTS for Fall Planting and Winter Blooming will be ready September 1st. Free to all applicants.

FLORAL PARK, Queens County (Long Island), N. Y.

SPRAY YOUR FRUIT TREES AND VINES

Worms Fruit and Leaf Blight of Apples, Pears, Cherries, Grape and Potato Rot, Plum Curculio prevented by using EXCELSIOR SPRAYING OUTFITS. PERFECT FRUIT ALWAYS SELLS AT GOOD PRICES. Catalogue showing all injurious insects to Fruits mailed free. Large stock of Fruit Trees, Vines, and Berry Plants at Bottom Prices. Address WM. STAHL, Quincy, Ills.

GLASS

For GREENHOUSES, GRAPERIES, CONSERVATORIES, HOTHOUSES AND HOTBEDS.

VANHORNE, GRIFFEN & CO.

Importers of French Glass. Bent Glass. Skylight Glass.

Special Importation for Rose-house purposes.

131, 133, 135 & 137 FRANKLIN ST., NEW YORK CITY.

BERMUDA AS A SUMMER RESORT.—It is proposed to keep open several of the hotels and boarding-houses during this summer for the accommodation of tourists who would like to combine A SIXTY HOUR SEA VOYAGE with their outing at the sea-shore. 86° is the highest temperature ever recorded by the U. S. Signal Observer. Range of Temperature, July and August, is from 65° to 83°. BERMUDA ISLAND is 700 miles due south-east from New York. British Colony. Cable connection with New York. One hundred miles stone road; good hotels; fine shops; delightful yachting and rowing; best of fishing; perfect cycling; ideal land for artists; superb sea bathing, still or surf; MALARIA UNKNOWN. Steamers leave New York weekly. For information apply to A. E. Outerbridge & Co., 39 B'way, N. Y. City. THOS. COOK & SON.

Arnold, Constable & Co

LYONS SILKS.

Novelties received by last French Steamer.

Raye and Faconne Moire Antique,
Plain and Glace Antique
Brocaded Pompadour effects,
White Satin Stripe

MOIRE ANTIQUE and FAILLE

White and Cream Veloutine,
Satin and Bengaline
White Brocades.

COLORED SATINS, CORDED VELOUTINES

Dark and Light Shades, for Street and Evening Wear.

Black Moire Antique, Moire Francais,

Faille and Veloutine,
Grenadine, Crepe de Chine,
Mousseline de Soie,
Plain and Embroidered, for Evening Wear.

LYONS VELVETS.

Broadway & 19th st.
New York.

HITCHINGS & CO.

Established 1844.

Greenhouse Heating
AND
VENTILATING.

Base-Burning Water Heaters for Small Conservatories.

Corrugated Fire Box Boilers for large Greenhouses

Horticultural Architecture
AND BUILDING.
Greenhouses, Conservatories, Palm Houses, etc.

Erected complete, or the Structural Iron work shipped ready for erection, with plans, details, and full instructions to enable the local builder to erect same.

HITCHINGS & CO.,
No. 233 Mercer Street, New York.
Send Four Cents postage for Illustrated Catalogue.